

United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

National
Wildlife
Research
Center



Wildlife Services Seeking Solutions Through Research

Resolving Human-Wildlife Conflicts Through New Technologies

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National Wildlife Research Center Scientists Explore Animal Senses for New Technologies

Wildlife Services' (WS) National Wildlife Research Center (NWRC) is the only Federal research organization devoted exclusively to resolving conflicts created by the interaction of wildlife and humans through the development of effective, selective, and acceptable methods, tools, and techniques. Chemists at NWRC modify, adapt, and develop new methods to analyze numerous compounds in order to determine their potential utility in wildlife damage management.

Despite considerable demand for nonlethal methods in wildlife damage management, very few effective chemical repellents and attractants exist for most species. There is a growing need for selective attractants which could be used to deliver pharmaceutical materials, such as vaccines and contraceptives, to wildlife. To locate these attractants, NWRC is currently investigating the sensory systems in several wildlife species important to the WS program and its stakeholders. New tests are being developed which will reduce the need for animal testing during the screening phases of repellents and lures. Other experiments focus on developing agents which can be applied to certain crops that will block or mask the attractiveness of these crops to wildlife. These agents will eliminate the sensory and nutrient rewards normally sought after by wildlife, which hopefully will reduce the incentive of wildlife to cause damage to the protected crops. Much of the analytical work, due to the nature of discovery at the molecular level of cells, will be performed in NWRC's highly specialized chemistry laboratories which include the use of specific techniques and equipment.

Groups Affected By These Problems:

Agricultural producers
Wildlife management specialists
Aquaculture producers



Applying Science and Expertise to Wildlife Challenges

Characterization of Sensory Input—NWRC researchers are refining a method for analyzing specific sensations in rats (a sample mammal) and chickens (a sample bird). An assessment is being made as to whether there are fundamental differences in pain/irritation sensations between birds and mammals. Additionally, NWRC is determining whether rat and chicken cells may be used as model systems for other bird/mammal species.

Bird-specific Anti-sweet and Anti-nutrient Properties—NWRC chemists are developing a substance to mask the sweet properties of sugars (found in ripened fruit) to birds. Similarly, a substance is being developed to act as a fat-blocker for birds that forage on oil-seed crops (i.e., sunflowers), thus eliminating the incentive to feed on the crop. Prototypes will be field tested to determine the effectiveness of these applications on crops to reduce or eliminate the incentive for birds to cause damage to fruit crops and oil-seed crops.

Bird Repellents—NWRC scientists are screening certain chemical compounds to determine their effectiveness as bird repellents. In addition, a remote-controlled and -activated system for bird hazing is being developed to decrease cormorant depredations on catfish farms.

Major Research Accomplishments:

WS developed an integrated hazing system to reduce bird flyovers and landings on ponds

WS developed a technique to rapidly screen and identify potential chemical repellents, thus avoiding the need for live animals in repellent chemical testing

Selected Publications:

Bryant, B.P., A. Savchenko, L. Clark and J.R. Mason. 2000. Potential for Cell Culture Techniques as a Wildlife Management Tool for Screening Primary Repellents. *Int'l Biodeterioration & Biodegradation* 45:175-181.

Mason, .R. and L. Clark. 2000. The Chemical Senses in Birds. Sturkie's Avian Physiology. Fifth edition. Academic Press: San Diego, CA. pp. 39-56.